INTRODUCTION

1. I broadly support all three proposals in this docket, RM-9404 concerning Low Frequency allocations for the Amateur Radio Service, RM-10209 concerning a new amateur band near 5 MHz and RM-9949 concerning the Amateur and Amateur Satellite allocation at 2400-2402 MHz.

S-BAND

2. Frequencies in the vicinity of •S-Band•, 2-4 GHz, will continue to become increasingly valuable to many services in the near term. It is vital that the Amateur Radio Service and the Amateur Satellite Service maintain a permanent presence in this region in order to fulfill their technical education goals. Operators and experimenters must have access to frequencies in order to do meaningful work with them whether in technology development and demonstrations, self-education, propagation studies or some form of communications.

LOW FREQUENCY

3. Although the proposed Low Frequency allocation is not as commercially contested as at S-Band, the reasoning of Paragraph 2 applies there as well.

SIXTY METERS

4. The balance of this comment concerns RM-10209, the proposal for an amateur service allocation in the vicinity of 5 MHz.

5. If 5 MHz is considered a frequency of last resort when no other band is available, computer modeling of propagation and the ARRL•s experiments at 3.5-4.0, 5.1-5.5, and 7.0-7.3 MHz do not present a conclusive case for such an allocation to the amateur service. In most cases, when propagation is present near 5 MHz, it also appears on one of the other bands. There are other compelling factors, however, not addressed by modeling or the ARRL tests that are discussed here.

PERSONAL EXPERIENCE

6. I was presented with an ARRL Public Service Award •in consideration of meritorious work in connection with a tornado in the Burnet-Hubbard, Texas, area on March 10, 1973, as related in June 1973 QST, page 75.• The emergency communications in connection with this local disaster were conducted primarily on 3.93 and 7.29 MHz lower sideband. The region of interest was central Texas. I was located in Hubbard, Net Control was in Hillsboro, 25 miles away, Burnet was 100 miles distant, and the supporting stations were in a region of 100-200 miles radius. All paths used Near Vertical Incidence Skywave(NVIS) propagation. Stations at the emergency sites conserved energy by limiting transmissions and

refraining from linear amplifier operation as much as possible.

7. Under these circumstances, the 7.29 MHz frequency was satisfactory from 10 a.m. to 4 p.m. local time and the 3.93 MHz frequency was used the rest of the time although it was best only from 7 p.m. through the night to 8 a.m. Between 8 a.m. and 10 a.m. absorption was high making copy difficult at medium power levels. Propagation shortly after 4 p.m.

may still have been adequate over these NVIS paths but foreign broadcast

interference increased significantly at that hour due to program and antenna pattern changes by the foreign broadcasters as a dropping critical frequency in the early evening brought up signal levels over the longer broadcast paths. This necessitated an early change to 3.93 MHz despite the operational penalty of poor copy at that hour. (Note that amateurs and broadcasters share 7.1 to 7.3 MHz, a segment that includes the entire 40-meter phone band. No traffic was handled on CW during this particular disaster.)

PROPAGATION MATTERS

8. These propagation characteristics were typical in that region in the spring of 1973 and also in other regions and seasons. The operating constraints cited were and still are typical of stations operating under

emergency conditions. An amateur band near 5 MHz would have nicely filled the mid morning and early evening periods where 3.93 MHz was difficult and 7.29 MHz experienced low signal levels with high interference.

9. Disasters occur at unpredicted times and propagation during such events cannot be known in advance. Worst-case propagation analysis is more appropriate to these situations than nominal case or seasonally averaged studies.

NON-PROPAGATION MATTERS

10. One interpretation of data from propagation simulations and the ARRL

experiments is that, over certain paths, propagation on 3.9 MHz and near

5 MHz is often concurrent, however, noise levels at 3.9 MHz are usually higher making copy there more difficult.

11. Amateurs residing in urban areas, where the need for disaster communication may be most critical, live under increasingly restricted property constraints. An efficient 90-foot dipole, appropriate for 5 MHz will be possible in many circumstances where a 120-foot dipole, appropriate for 3.75 MHz cannot be constructed or effectively operated. Portable operations and other antenna designs can suffer from similar restrictions. Many amateurs now limited to 7 MHz and above by these restrictions will be limited to 5 MHz and above given this allocation thereby gaining greatly increased regional communications capabilities particularly in the nighttime hours.

12. The strength of amateur radio in communications emergencies arises largely from its loosely coordinated, ad-hoc, individually contributed

efforts and equipment. Self-selected operators with widely varied skills and equipment need maximum leeway in choosing communications paths among themselves.

THE BOTTOM LINE: FLEXIBILITY

13. An Amateur Radio allocation near 5 MHz is needed to give the available amateurs on the scene maximum flexibility to establish adequate communications over needed paths in the presence of antenna restrictions, varying noise, absorption, critical frequency, interference and other difficulties.

EMISSION TYPES AND POWER LEVEL

14. Inasmuch as good amateur practice already includes listening before transmitting and using the minimum power necessary to conduct the intended communication, power limitations and mode restrictions peculiar

to a 5 MHz allocation are not needed. As recommended by the ARRL, all emission types commonly used on high frequency: RTTY, data, phone, and image, should be permitted with output power limited to 1500 watts PEP. This simplifies the regulations and provides maximum flexibility to operators as discussed in Paragraph 13.

SUB-BANDS NOT NEEDED

15. In addition, sub-bands are not needed on a 5 MHz allocation. The 1.8-2.0 MHz (160 meter) allocation is known within amateur radio as •The

Gentlemen•s Band• although it has no regulated sub-bands. Amateurs exercising good practice are able to cooperate using informal sub-bands and windows there without undue difficulty and will also be able to coexist in a 5 MHz allocation without specially regulated protections and subdivisions. As needs and conventions evolve, or in response to particular circumstances such as an emergency, these informal arrangements can be modified without regulatory intervention.

RADIATION EXPOSURE LIMITS

16. Paragraph 97.13(c)(1) of the regulations governing amateur radio will need to be extended to include Radiation Exposure Limits for the 5 MHz allocation.

ACKNOWLEDGMENTS

17. The author wishes to acknowledge the valuable and insightful contributions of Jan Tarsala, WB6VRN, Jim Lux, W6RMK, John Zitzelberger,

W6GL, and Ralph Wallio, W0RPK, to the discussion of this matter.

BIOGRAPHY

18. Courtney Duncan, N5BF, was first licensed in 1972 and has been active in many aspects of amateur radio including homebrewing, satellite

operation and management, traffic handling, contesting, awards, emergency communications, public service, regulatory and policy matters,

advanced operating modes, rag chewing and software defined radios among others. He is a former Vice President for Operations of the Radio Amateur Satellite Corporation, AMSAT-NA, and is a member of the Jet Propulsion Laboratory Amateur Radio Club, W6VIO. A Life Member of both ARRL and AMSAT-NA, he resides in La Canada, California with Viann, WD5EHM, Viannah, KG6GXW, Katherine, KG6HUI, and John, KG6HCO.